

VISHNYAKOV, V.A.; ZYKOV, A.I.

Effect of displacement of the optimum frequency of an  
injector accelerator. Zhur.tekh. fiz. 34 no. 2:379-381  
F '64. (MIRA 17:6)

1. Fiziko-tehnicheskii institut AN UkrSSR, Khar'kov.

28(5)

AUTHOR:

Zykov, A.I.

SOV/115-59-3-20/29

TITLE:

The Measuring of Impedances by a Directional Coupler  
(Izmereniye polnykh soprotivleniy s pomoshch'yu  
napravlennoy otvetvitelya)

PERIODICAL:

Izmeritel'naya tekhnika, 1959, Nr 3, pp 44-46 (USSR)

ABSTRACT:

In the range of super-high frequencies the directional coupler with a matched load in one of the secondary wave guide sections is widely used for finding the modulus of the reflection coefficient  $\rho$  in the basic wave guide in regard to the ratio of signal amplitudes in the opposite branches of the coupler. Thereby it is not possible to measure the reflection phases. It is difficult to measure small magnitudes of  $\rho$ , since the sensitive elements are quadratic as a rule. Therefore, the signal amplitude ratio is equal to  $\rho^2$  and an indicator with a wide dynamic measuring range is required at small magnitudes of  $\rho$ . The consideration of a directional coupler with a reflecting plunger in the load wave guide shows that

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SOV/115-59-3-20/29

The Measuring of Impedances by a Directional Coupler

this device is free of the aforementioned deficiencies. The author presents a formula for a wave propagated in the secondary wave guide of the coupler and then explains the measurement errors. Finally he compares an impedance measuring circuit composed of a directional coupler with a shorting plug with the measuring line IVL-1. The directivity of the coupler at  $\lambda_0 = 10.7$  cm was equal to 40 db. The graphs, figures 4 and 5, show the results of the comparison. There are 2 diagrams, 2 graphs and 2 Soviet references.

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69425

S/141/60/003/01/019/020

E192/E582

9.9000

AUTHORS: Zykov, A.I. and Kononenko, S. G.

TITLE: Measurement of the Input Impedance of a Periodic Waveguide by Means of an Arbitrary Load

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiofizika, 1960, Vol 3, Nr 1, pp 152-155 (USSR)

ABSTRACT: The waveguide considered is shown in Fig 1. The complex reflection coefficient of the system is

$$\bar{p} = p e^{-i(\varphi_{BX} - \delta\varphi)}$$

which is a periodic function of  $L$  (see Fig 1). The parameter  $p$  of the above equation is defined by Eq (1), while  $\text{tg}(\delta\varphi)$  is expressed by Eq (2). In these equations  $\lambda_0$  is the wavelength in the waveguide and  $\varphi'_{BX}$  is the phase of the reflection coefficient at the input when the wave propagates in the reverse direction (Ref 4). Analysis of Eqs (2) shows that if the position of the load is chosen as  $L = L_0$  and  $L = L_0 \pm \lambda_0/4$ , so that the

Card 1/3 phases of the reflection coefficient at the input are

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E192/E582

# Measurement of the Input Impedance of a Periodic Waveguide by Means of an Arbitrary Load

equal or differ by  $180^\circ$ , two equations are obtained. On the basis of these equations it is possible to obtain the expressions for the standing-wave ratios. The final formulae are:

$$K_{BX} = \sqrt{(K)_{L=L_0} (K)_{L=L_0 \pm \lambda_0/4}} \quad (3)$$

$$(K_H)_{L=L_0 \pm n\lambda_0/4} = \sqrt{(K)_{L=L_0} (K)_{L=L_0 \pm \lambda_0/4}} \\ (n = 0, 1, 2, \dots).$$

where the two (K) represent the standing wave ratios of the input line for  $L = L_0$  and  $L = L_0 \pm (\lambda_0/4)$ . Figs 2 show the graphs of the standing wave at the input; these were measured with two different loads at a fixed input impedance. In order to determine rapidly the input impedance it is necessary to measure only the dependence

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S/141/60/003/01/019/020

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Measurement of the Input Impedance of a Periodic Waveguide by  
Means of an Arbitrary Load

of the position of the standing wave minimum on the position of the load. The practical experience showed that it is possible to construct a load such that it will be fully matched with the waveguide at pre-determined positions. Fig 3 illustrates the dependence of the standing wave ratio and the phase of the reflection coefficient on  $L$  by employing such a "matched" load. It is seen from the figure that the extrema are strongly expressed.

There are 3 figures and 4 references, 3 of which are Soviet and 1 English.

ASSOCIATION: Fiziko-tekhnicheskii institut AN UkrSSR (Physics-  
Engineering Institute of the Academy of Sciences of the  
Ukrainian SSR)

SUBMITTED: April 21, 1959

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S/100/60/005/06/006/021

E140/E163

AUTHORS: Zykov, A.I., and Kononenko, S.G.

TITLE: Input Impedance of a Periodically Loaded Waveguide  
Measured in a Band of Frequencies Using an Arbitrary  
Load

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 6,  
pp 926-929 (USSR)

ABSTRACT: This paper was presented at a meeting of the Academy of  
Sciences of the Ukr.SSR, Khar'kov, April 7, 1959.  
Adjustable absorption loads are used to match  
periodically loaded waveguides to standard waveguides  
supplying power. The article describes a method and  
formulae for calculating the input impedance of the  
periodically loaded waveguide at an arbitrary frequency  
within the passband. For very long loads the agreement  
of theoretical and experimental results is poorer than  
for short loads. There are 2 figures, 1 table and  
3 references, of which 1 is English and 2 Soviet  
(translated from English).

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S/109/60/005/06/006/021

E140/E163

Input Impedance of a Periodically Loaded Waveguide Measured in a  
Band of Frequencies Using an Arbitrary Load

✓B

ASSOCIATION: Fiziko-tehnicheskii institut AN USSR  
(Physico-Technical Institute, Academy of Sciences,  
Ukr. SSR)

SUBMITTED: May 26, 1959

Card 2/2



9.1300

9/109/60/005/07/020/024  
E140/E163

AUTHORS: Grishayev, I.A., and Zykov, A.I.

TITLE: The Influence of Production Tolerances on the Bandwidth  
of a Diaphragmed Waveguide

PERIODICAL: Radiotekhnika i elektronika, Vol 5, No 7, 1960,  
pp 1182-1184 (USSR)

ABSTRACT: This question has until now been inadequately studied in  
the literature. From experimental results it seems that  
the optimal distribution of the dimension 2b along the length of  
the diaphragmed waveguide is that where it fluctuates about a  
monotonically increasing mean value (Fig 3, II).  
There are 3 figures and 6 references, of which 3 are Soviet and  
3 English.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN USSR  
(Physico-Technical Institute of the Academy of  
Sciences of the Ukr. SSR)

SUBMITTED: June 17, 1959

Card 1/1

83275

S/109/60/005/009/025/026  
E140/E455

911300

AUTHORS: Grishayev, I.A., Zykov, A.I. and Kononenko, S.G.

TITLE: Matching of Diaphragmed Waveguide 25

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.9,  
pp.1549-1553

TEXT: Matching between a diaphragmed waveguide delay system and a rectangular waveguide is carried out by a matching transition. A reflection-factor meter employing a directional coupler is described. Two methods of obtaining travelling waves in the diaphragmed waveguide are described: 1) the method of adiabatic waveguide; 2) the method of series match. The use of an arbitrary load to measure SWR and reflection phase is described. There are 4 figures and 4 references: 3 Soviet and 1 English.

SUBMITTED: June 17, 1959, initially  
February 29, 1960, after revision

Card 1/1

20112

S/109/60/005/012/010/035  
E192/E482

9.1310

AUTHORS: Zykov, A.I., Tkachenko, V.D. and Ostrovskiy, Ye.K.

TITLE: Pulse Measurement of the Reflection Factor of a  
Periodic Waveguide

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.12,  
pp.1933-1936

TEXT: The paper presents a method and experimental results of measuring the reflection factor of a diaphragmed waveguide under pulse conditions. It is found that the distortion of the pulse envelope in such a waveguide 3.5 m long is very severe and the SWR measured under stationary conditions does not reflect the true situation. The envelope settling time is much greater than the pulse duration (2  $\mu$  sec). The form of pulse reflected back to the input of the waveguide at various frequencies is shown in Fig.3. Under such conditions, the SWR measured by a pulse method can only have a formal significance; in the present paper the SWR was measured at the centre of the pulse. Under these conditions, differences of up to 35% between the pulse and stationary SWR's were found. There are 3 figures and 1 table.

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Pulse Measurement of ...

20412  
S/109/60/005/012/010/035  
E192/E482

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR  
(Physicotechnical Institute AS UkrSSR)

SUBMITTED: February 29, 1960

Fig.3.

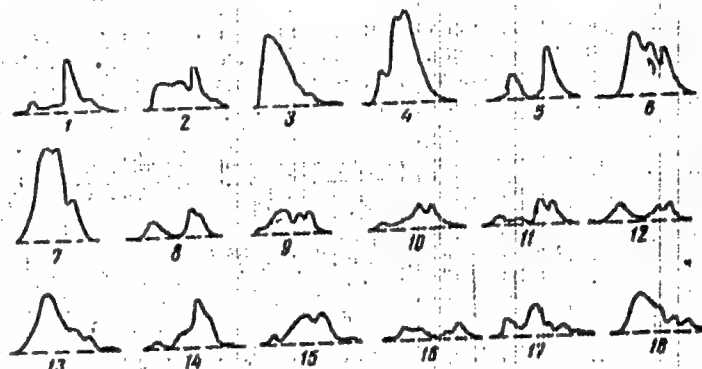


Рис. 3. Форма отраженного импульса на входе дифрагмированного волновода при различных частотах

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S/057/60/030/008/014/019  
B019/B060

AUTHOR: Zykov, A. I.

TITLE: The Separation of an Electron Beam at the Outlet of a Linear Accelerator<sup>7</sup> With the Aid of an Electromagnetic Wave in a Wave Guide

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 8, pp. 971-974

TEXT: The author suggests a separation method for the beam of accelerated electrons, in which the clusters of electrons are deviated from the original direction toward different sides by small, equally large angles (Fig. 1). This method is based on the interaction of the electron cluster with a transverse electric wave in a wave guide. The size of the shift of cluster centers relative to the original direction is determined with high-frequency oscillations. The forces acting on an electron in a rectangular wave guide are explained with the aid of Fig. 2, and the equation of motion (3) is derived for an electron. The distances between the clusters are estimated, and next the separator shown in the scheme of Fig. 3

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The Separation of an Electron Beam at the Outlet  
of a Linear Accelerator With the Aid of an  
Electromagnetic Wave in a Wave Guide

S/057/60/030/008/014/019  
B019/B060

is discussed. In it, the angle between the neighboring clusters is enlarged by repeating the separation in a resonator for traveling waves. A discussion is finally made of the consequences arising from the nonfulfillment of the assumption of the phase lengths of electron clusters being equal to zero. Estimations are made of the angle spread of electrons at the outlet. There are 3 figures and 1 Soviet reference.

ASSOCIATION: Fiziko-tekhnicheskii institut AN USSR Khar'kov  
(Physico-technical Institute of the AS UkrSSR, Khar'kov)

SUBMITTED: July 24, 1959

✓ B

Card 2/2

15120  
S/058/63/000/001/015/120  
A062/A101

24.6730

AUTHORS: Sinel'nikov, K. D., Grishayev, I. A., Grizhko, V. M., Fisun, A. N.,  
Zykov, A. I., Kitayevskiy, L. Kh.

TITLE: A 30 MeV energy linear travelling-wave electron accelerator

PERIODICAL: Referativnyy zhurnal, Fizika, no. 1, 1963, 39 - 40, abstract 1A374  
(In collection: "Elektron. uskoriteli." Tomsk, Tomskiy un-t, 1961,  
3 - 9)

TEXT: The authors describe a 30 MeV linear electron accelerator designed  
at the Physico-technical Institute of the Academy of Sciences of the Ukrainian  
SSSR. The accelerator consists of two sections connected with each other - the  
injector section and the main section (with a constant wave phase speed); the  
length of the main section is 2.8 m, the value  $ka = 2.48$  ( $k$  - wave vector,  $a$  -  
- waveguide radius). The two sections are energized by one klystron power ampli-  
fier, excited by a magnetron generator. The power dissipated in the main section  
and in the output load is  $\sim 10$  Mw (in the load 3.3 Mw); the field intensity is  
then 150 kV/cm. The accelerating system is composed of separate resonators; the

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A 30 MeV energy linear travelling-wave...

S/058/63/000/001/015/120  
A062/A101

electrical contact between them is realized by mechanical ties in the places where the system is connected to the input and output matching transformers. The resonators of the main section are disposed tightly in a copper tube which is also a vacuum housing. The precision of manufacture of the accelerating system (diameter of the resonators and diaphragm apertures) is  $\pm 0.01$  mm. The source of electrons is an electron gun operating under the tension of 79 kV (the corresponding electron velocity is 0.5c); the current is 1 amp. in a pulse. The pumping out of the vacuum volume of the accelerator is effected by 5 diffusion pumps; the operating pressure in the klystron amplifier is  $2 \cdot 10^{-7}$  mm Hg, in the remaining space  $3 - 5 \cdot 10^{-7}$  mm Hg. Measurements have shown that the maximum intensity and energy are attained in the accelerator at the frequency 2796 Mc/s. The mean current of the accelerated electrons is  $10 \mu\text{A}$  for a pulse length of  $1 \mu\text{sec}$ . The diameter of the beam (at the output) under the optimum focusing is 3 - 4 mm, the spectrum width - 8%.

A. Pateyev

[Abstracter's note: Complete translation]

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21/28

S/120/61/000/002/037/042  
E210/E594

9.1300 (Incl 3301; also 1130)

AUTHORS: Zykov, A. I. and Dudkina, I. N.

TITLE: Detachable Coupling Device for Septate Waveguides

PERIODICAL: Pribery i tekhnika eksperimenta, 1961, No.2, p.181

TEXT: The author developed a detachable impedance coupling device for a septate waveguide. The use of the device in the matching junctions of a septate waveguide makes possible their final matching with individual sections of a long waveguide. For design consideration, the side half-wave line was made of two quarter-wave lines running in opposite directions. To eliminate the possibility of a breakdown, all sharp angles were rounded (2 to 3 mm radii). The length of the short-circuited line was varied until its standing-wave ratio was less than 1.05. In high-power pulse tests, the performance of the device was equal to that of an entire matched septate waveguide. This made it possible to incorporate the coupler into a detachable matching junction (see figure) which performed well at a power up to 12 megawatts. There are 1 figure and 2 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskii institut AN UkrSSR

~~Card 1/2~~ (Physico-Technical Institute AS UkrSSR)

*Submitted: April 1960*

9.13/0

4532  
S/109/63/008/001/012/025  
D266/D308

AUTHOR: Zykov, A. I.

TITLE: Approximate calculation of a matching section for a waveguide with iris

PERIODICAL: Radiotekhnika i elektronika, v. 8, no. 1, 1963, 90-98

TEXT: The purpose of the paper is to find a method for calculating the reflection coefficient in a rectangular waveguide which feeds microwave energy into an iris loaded circular waveguide. The width of the rectangular waveguide is  $l$ , its height  $D_1$  and it is coupled to the circular waveguide with the aid of a resonator of diameter  $2b_1$ . The rectangular waveguide and the resonator have a common symmetrical aperture of width  $h = l - 2d$ . The parameters of the iris loaded circular waveguide are given and the amplitudes of the space harmonics are assumed to be known. The Cartesian coordinate system introduced for the calculations is

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Approximate calculation of ...

S/109/63/008/001/012/025  
D266/D308

$$x = H - r \cos \theta$$

$$y = \frac{1}{2} + r \sin \theta$$

Writing the general form of the electric field (taken from L. Lewin's Advanced Theory of Waveguides, Iliffe and Son, London) both in the rectangular waveguide and in the resonator (in terms of Bessel and Neumann functions), matching them at  $x = 0$ , integrating from  $z = 0$  to  $z = D_1$  the following relationship is obtained:

$$1 + R = \frac{2}{1} \int_d^{1-d} E_z(y) \sin \frac{\pi y}{1} dy \quad (7)$$

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Approximate calculation of ...

S/109/63/008/001/012/025  
D266/D308

Thus, if the distribution of electric intensity in the aperture is known, the reflection coefficient can be easily determined. The variation of  $E(y)$  is assumed in the same form as for a thin iris in a rectangular waveguide but its amplitude (generally complex) is determined by matching the fields of the resonator and that of the circular waveguide. It is assumed that the microwave power (excluding reflection) carried by the rectangular waveguide is completely transformed into the fundamental space harmonic of the iris loaded waveguide. Thus only one mode and one space harmonic are considered in the circular waveguide (higher order modes of the resonator are taken into account). No explicit formulas are given for the reflection coefficient but the numerical procedure is described in detail. The calculations can be extended to the case when the coupling aperture is circular by defining an equivalent rectangular aperture. Measurements were carried out on two different waveguides showing excellent agreement with theoretical results. There are 4 figures. X

SUBMITTED: January 29, 1962

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U 110.5-43  
 SMT 11/15/1953 (REF. 1) - 11/15/1953 - 11/15/1953  
 01/01/1953 01/01/1953 01/01/1953

AUTHOR: Ostrovskiy, Ye. K.; Zy\*kov, A. I.; Kononenko, S. G.; Makhenko, L. A.; Dem'yanenko, G. K.; Manovets, Yu. A.; Rubtsov, A. S.

TITLE: Investigation of a shaping section with constant phase velocity for wave propagation

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 33, no. 6, 1953, 735-738

TOPIC TAGS: electronics, linear accelerators

ABSTRACT: The axial motion of electrons in a loaded waveguide in which the phase velocity for wave propagation is constant along its length was calculated by the method of J. Swiharta and E. Akeley (J. Appl. Phys., 24, 5, 1953). The waveguide is intended to be the initial section of an electron linear accelerator. The calculations were performed for a section 83 cm long excited to an electric field strength of 67.5 kV/cm and with the electrons injected at an energy of 80 keV. The results are displayed as a family of curves giving the exit electron energy as a function of the entrance phase for different values of the phase velocity from 0.91c to 0.99c. From these results, and taking into account the resolving power of a specific magnetic analyzer, the average energy of the electrons at maximum current in the bunch and the current at maximum density

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ACCESSION NR: AP3001335

were calculated as functions of the phase velocity. These calculated results do not agree with the experimental data. The experimental data indicate that capture and acceleration occur in a much narrower range of phase velocities. The divergence between experiment and the calculations is ascribed to end effects in the input junction, which is an H sub 10 to E sub 01 transformer similar to the Stanford variant. The effect of putting inserts in the final waveguide cavity at the junction wall was investigated, and an insert that greatly improves the operation was found. The authors do not consider such inserts to be a satisfactory solution, however, owing to their deleterious effect on the electric strength and because of the analytical complications they involve. Orig. art. has: 7 formulas and 3 figures.

ASSOCIATION: Fiziko-tekhnicheskii institut AN USSR, Khar'kov (Physical-Technical Institute, AN USSR)

SUBMITTED: 21May62

DATE ACQ: 01Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 001

OTHER: 005

Card 2/2

8/0057/63/053/006/0739/0742

ACCESSION NR: AP3001336

AUTHOR: Zykov, A. I.; Makhnenko, L. A.; Ostrovskiy, Ye. K.; Dim'yachenko, G. K.; Kononenko, S. G.; Rubtsov, K. S.; Kramskoy, G. D.; Mufel', V. B.

TITLE: Determination of the optimum frequency of a linear traveling-wave accelerator and investigation of the dependence of accelerated-particle energy on frequency

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 33, no. 6, 1965, 739-742

TOPIC TAGS: traveling-wave linear accelerator, phase velocity, group velocity accelerator, traveling-wave accelerator, linear accelerator

ABSTRACT: Simplified calculations of phase and group velocities of a traveling-wave linear accelerator using a septate waveguide section are suggested. These are based on the fact that in the case of small waveguide mismatch, i.e., when the VSWR is less than or equal to 1.1, it is possible to derive formulas for these respective parameters by applying the method of shifting the locations of VSWR minima by moving a shorting stub. This eliminates the need to plot complex circular diagrams. Since actual waveguides contain some inhomogeneities, it is necessary to average the standing-wave minimum displacements resulting from translation of the stub in the septate waveguide. The phase-velocity formula is

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ACCESSION NR: AP3001336

obtained by measuring the total linear displacement of the standing-wave minimum during the travel of the stub for the total number of resonators. This formula defines the dependence of phase velocity on frequency. Measurements made by this method for a septate waveguide with type  $\pi/2$  oscillations, a source frequency stability of  $10^{-7}$ , and a septate waveguide period equal to  $2.477 \pm 0.001$  cm showed that for a phase velocity equal to light velocity a frequency of 2796.58 Mc represents the optimum frequency for this waveguide. A straightforward calculation from the phase-velocity formula yields the corresponding group velocity. As regards the dependence of accelerator output on frequency, it is assumed that random deviations of phase velocity are insignificant and that the whole of the waveguide is homogeneous. From this a formula for kinetic energy as a function of frequency is derived. For the waveguide described the relative kinetic energy decreases by a factor of approximately 10 for a frequency change from 2796.6 to 2799 Mc. It is concluded that for septate waveguides with small inhomogeneities the method described determines optimum frequency, and phase and group velocities with adequate accuracy for practical purposes, since the maximum relative error does not exceed  $\pm 0.01\%$ . Orig. art. has: 3 figures and 8 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut, AN SSSR, Khar'kov (Physicotechnical Institute, AN SSSR)

Card 2/3



ACCESSION NR: AP3001336

SUBMITTED: 21May62

DATE ACQ: 01Jul63

ENCL: 00

SUB CODE: NS

NO REF SOV: 001

OTHER: 004

Card 3/3

ZYKOV, A.

Student participation is our goal. Prof. tekhn. obr. 21 no.1:16-17  
Ja '64. (MIRA 17:3)

1. Zamestitel' direktora po uchebno-proizvodstvennoy rabote gorod-  
skogo professional'no-tehnicheskogo uchilishcha No.7, Lipetsk.

ACCESSION NR: AP4013435

S/0057/64/034/002/0379/0381

AUTHOR: Vishnyakov, V.A.; Zy\*kov, A.I.

TITLE: Investigation of the effect of shift of the optimum frequency of an injection accelerator

SOURCE: Zhurnal tekhn. fiz., v.34, no.2, 1964, 379-381

TOPIC TAGS: linear accelerator, electron accelerator, linear accelerator matching cavity, linear accelerator frequency adjustment, accelerator matching cavity insert

ABSTRACT: The effect of a metal insert in the matching cavity of a linear accelerator on the performance of the accelerator was investigated experimentally. The type of insert investigated is illustrated in the Enclosure. The 83 cm long accelerator was of the constant phase velocity type intended for performing the bunching and injection functions for a larger installation. The initial electron energy was 80 keV, and the final energy was 6 MeV. The optimum frequency of the accelerator, corresponding to maximum electron capture, was determined as a function of the position of the insert. With an 80 kV/cm accelerating field, the optimum frequency, which was

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ACCESSION NR: AP4013438

2803 megacycles without the insert, dropped to a minimum of 2799 megacycles, and subsequently increased as the insert was moved farther into the matching cavity. This behavior is ascribed to the excitation in the presence of the insert of a wave having a phase shift across the matching cavity of  $90^\circ$  in addition to the normal wave of phase shift  $180^\circ$ . Calculations substantiated this interpretation. It is suggested that the insert may be employed when an adjustment of the frequency is necessary to secure optimum performance, and to compensate inaccuracies in the design and construction of the accelerator. "The authors consider it their pleasant duty to express their gratitude to I.A.Grishayev and Ye.K.Ostrovskiy for discussing the results of the work." Orig.art.has: 2 formulas and 3 figures.

ASSOCIATION: Fiziki-tehnicheskiy institut AN UkrSSR, Khar'kov (Physical-Technical Institute, AN UkrSSR)

SUBMITTED: 03Jun63

DATE ACQ: 26Feb64

ENCL: 01

SUB CODE: PH, SD

NR REF SOV: 008

OTHER: 000

Card 2/2

ZYKOV, A.I.; OSTROVSKIY, Ye.K.; MAKHNENKO, L.A.

Effect of the configuration of the electromagnetic field of the input transition on the dynamics of electrons in the grouping section with a constant phase velocity of the wave. Zhur. tekhn. fiz. 33 no.9:1066-1069 S '63.

(MIRA 16:11)

1. Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov.

ZYKOV, A.I.; OSTROVSKIY, Ye.K.

Electron modulation in the input matcher of the shaper of a linear  
accelerator. Zhur. tekhn. fiz. 39 no.1:149-153 Ja '64. (MIRA 17:1)

ACCESSION NR: AP4009935

S/0057/64/034/001/0149/0153

AUTHOR: Zy\*kov, A.I.; Ostrovskiy, Ye. K.

TITLE: Electron modulation in the input matching cavity of the bunching section of a linear accelerator

SOURCE: Zhurnal tekhnicheskoy fiziki, v.34, no.1, 1964, 149-153

TOPIC TAGS: accelerator, linear accelerator, electron accelerator, matching cavity, linear accelerator matching cavity, linear accelerator efficiency

ABSTRACT: The acceleration of electrons by the field in the matching cavity at the input to a constant phase velocity buncher of a linear accelerator affects the acceptance and acceleration of the electrons by the buncher. This effect is calculated for a matching cavity of the type commonly employed and shown in section in Fig. 1 of the Enclosure. The phase relation between the fields in the matching cavity and the diaphragmed bunching section is obtained from previous work of one of the authors (A.I.Zy\*kov, Radiotekhnika i elektronika, 8, No.1, 1963). The equations of motion of the electron were numerically integrated across the matching cavity, and the resulting phase and energy of the electron at the entrance to the buncher are pre-

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2

ACC.NR: AP4609935

sented graphically as functions of the phase at the input to the matching cavity. The numerical integration was performed for 80 keV incident electrons, a wavelength of 10.71 cm, and the values  $D_1 = D = 2.27$  cm,  $t = 0.47$  cm for the dimensions of the cavity (see Fig.1 of the Enclosure). From these results and calculations previously performed for the buncher without the matching cavity (Ye.K.Ostrovskiy, A.I.Zy\*kov, S.G.Kononenko, L.A.Makhnenko, G.K.Dem'yanenko, Yu.N.Manovets and K.S.Rubtsov, ZhTF, 33, No.6, 1963), curves were constructed showing the accelerated electron energy as a function of the initial phase for various values of the phase velocity (frequency) in the buncher. The acceptance angle is very considerably decreased by the presence of the matching cavity, especially at high phase velocities. This behavior was previously known from experiment (A.I.Zy\*kov, Ye.K.Ostrovskiy and L.A.Makhnenko, ZhTF, 33, No.9, 1963). Results of the present calculations are now, however, compared with data from the earlier experiments and quantitative agreement is found. It is concluded from this that the present method of calculation can be employed with confidence for design purposes. Orig.art.has: 12 formulas and 6 figures.

ASSOCIATION: none

SUBMITTED: 01Nov62

DATE ACQ: 10Feb64

ENCL: 01

SUB CODE: PH,SD

NR REF SOV: 003

OTHER: 003

Card 2/3



ZYKOV, A.I.; OSTROVSKIY, Ye.K.

Methods for calculating the parameters of a buncher with  $v_g = \text{const.}$   
Zhur. tekhn. fiz. 33 no.7:892-894 J1 '63. (MIRA 16:9)

1. Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov.  
(Particle accelerators) (Electron beams)

OSTROVSKIY, Ye.K.; ZYKOV, A.I.; KONONENKO, S.G.; MAKHINENKO, L.A.;  
DEM'YANENKO, G.K.; MANOVETS, Yu.N.; RUBTSOV, K.S.

Study of a forming section with a wave of constant phase  
velocity. Zhur. tekhn. fiz. 33 no.6:735-738 Ju '63.

(MIRA 16:6)

1. Fiziko-tehnicheskiy institut AN UkrSSR, Khar'kov.  
(Wave guides)

SOIN, Aleksandr Ivanovich, stalevar; BOBIKOV, Sergey Aleksandrovich, brigadir  
slesarey, deputat Traktorzavodskogo rayonnogo soveta Volgograda;  
ZYKOV, Andrey Ivanovich, naladchik kuznechnogo tsekha, udarnik  
~~komunisticheskogo truda~~; DIDENKO, Vladimir Ivanovich; IVANOV, Boris  
Ivanovich

With the sharp eye of a passenger. Zhil.-kom. khos. 12 no.9:23-25  
S '62. (MIRA 16:2)

1. Volgogradskiy traktornyy zavod im. F.E.Dzerzhinskogo (for Soin,  
Bobikov, Zykov). 2. Redaktor gazety "Traktor" Volgogradskogo traktornogo  
zavoda im. Dzerzhinskogo (for Didenko). 3. Glavnyy inzh. tramvayno-  
trolleybusnogo upravleniya Volgograda (for Ivanov).  
(Transportation)

L 19079-63

ACCESSION NR: AP0003966

ENT(m)/BDS/ES(w)-2

AFMTC/ASD/AFWL/IJP(G)/BSD

Pab-4

S/0057/63/033/007/0392/0394

AUTHOR: Zy\*kov, A.I.; Ostrovskiy, Ye.K.

TITLE:

Method of calculating the parameters of a constant phase velocity buncher

SOURCE: Zhurnal tekhnicheskoy fiziki, v.33, no.7, 1963, 892-894

TOPIC TAGS: linear accelerator, buncher

ABSTRACT: The two total differential equations relating the (longitudinal) position of an electron in a constant phase velocity linear accelerator, its energy, and its phase with respect to the accelerating wave, are written down, with reference to work of E.Akeley and D.Caplan (J.Appl.Phys., 23, 774, 1952) and J.Swihart and E.Akeley (J.Appl.Phys., 24, 640, 1953). In the references cited, these equations are solved by a separation of variables which leads in the first instance to expressions for the energy and the position of the electron as functions of its phase. Because it is the relation between energy and position that is frequently of primary interest, the authors prefer a different separation of the variables that leads to expressions for the position and phase of the electron as functions

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ACCESSION NR: AP:003966

of its energy. The solution of the differential equations by the preferred method is reduced to a quadrature. When the phase velocity of the accelerating wave is equal to the velocity of light, the integral is elementary, and it is evaluated. Otherwise, the integral reduces to incomplete elliptic integrals of the first and third kinds. The reduction is not given; the authors recommend numerical integration. Orig.art.has: 9 formulas.

ASSOCIATION: Fiziki-tekhicheskiy institute AN UkrSSR, Kharkov (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 01Nov62

DATE ACQ: 07Aug63

ENCL: 00

SUB CODE: PH

NO REF SOV: 000

OTHER: 002

Card 2/2

ZYKOV, A.I.; MAKHNENKO, L.A.

Calculating the phase velocity of a wave in the septate wave guide of a linear accelerator. Zhur. tekhn. fiz. 35 no.3: 489-495 Mr '65.

Calculation of the group wave velocity and damping in the septate wave guide of a linear accelerator. Ibid.: 502-507 (MIRA 18:6)

MAKHNENKO, L.A.; ZYKOV, A.I.; KRAMSKOY, G.D.

Calculating the field intensity in a traveling-wave linear accelerator. Zhur. tekhn. fiz. 35 no.3:496-501 Mr '65.

Determining the equivalent reflection coefficient of the septate wave guide of a linear accelerator. Ibid.:508-510  
(MIRA 18:6)

ZYKOV, A.M.

Reaction smelting of lead concentrates. Trudy LPI no.223:190-199  
'63. (MIRA 17:11)



ZYKOV, A. M. : "Experimental investigation of chemical reactions in the lead-sulfur-oxygen system, as the basis of the reactive smelting of lead concentrates." Min Higher Education USSR. Leningrad Polytechnic Inst imeni M. I. Kalinin. Leningrad, 1956. (Dissertation for the Degree of Candidate in Technical Sciences).

SO: Knizhaya letopis', No 23, 1956

ZYKOV, A. M.: Master Tech Sci (diss) -- "Analysis and investigation of basic parameters for determining the dimensions on working machinebuilding drawings". Novocherkassk, 1958. 21 pp (Min Higher Educ USSR, Novocherkassk Order of Labor Red Banner Polytech Inst im S. Ordzhonikidze), 160 copies (KL, No 2, 1959, 121)

ZYKOV, A.M., redaktor

[Tower silo made of manufactured parts, with a 250 T. capacity;  
frame and siding elements for walls] Silosnaia bashnia iz detal'ei  
zavodskogo izgotovleniia emkost'iu 250t; steny karkasno-obshivnoi  
konstruktsii. Proekt no.1111. Moskva, 1956. 6 p., 7 plans.

(MIRA 10:3)

1. Russia (1923- U.S.S.R.) Ministerstvo gorodskogo i sel'skogo  
stroitel'stva.  
(Silos)

ZYKOV, A.M., redaktor

[Silo trenches and pits constructed from manufactured elements.  
Plan no.1114] Silosnye transhei i iamy iz detalei promyshlennogo  
izgotovleniia. Proekt no.1114. Moskva, 1956. 9 p., 8 plans.

(MLRA 10:3)

1. Russia (1923-  
stroitel'stva.  
(Silos)

U.S.S.R.) Ministerstvo gorodskogo i sel'skogo

ZYKOV, A.M., redaktor

[Sheep barn housing 300 sheep for central and northern regions;  
log walls with brick columns] Ovcharnia na 300 ovets dlia tsentral'-  
nykh i severnykh raionov; steny brevenchatye v kirpichnykh stolbakh.  
Proekt no.0303. Moskva, 1956. 11 p., 8 plans. (MIRA 10:3)

1. Russia (1923- U.S.S.R.) Ministerstvo gorodskogo i sel'skogo  
stroitel'stva  
(Sheep houses and equipment)

ZYKOV, A.M., redaktor

[Stable for 20 work horses; walls made of reeds on frame]  
Koniushnia na 20 rabochikh loshadei; steny karkasno-kamyshitovye.  
Proekt no. 0434. Moskva, 1956. 12 p., 10 plans (MLRA 10:4)

1. Russia (1923- U.S.S.R.) Ministerstvo gorodakogo i  
sel'skogo stroitel'stva.  
(Stables)

ZYKOV, A.M., redaktor

[Swine house for 20 sows with young and fattening swine or for 30 sows with young up to 4 months of age; walls - brick, columns with adobe filler] Svinarnik na 20 avinomatok s molodpiakon i otkormochnym pogolov'iem ili na 30 osnovnykh matok s priplodon do 4 mesiatsy; steny - kirpichnye, stolby s samannym zapolneniem. Proekt no.0286. Moskva, 1956. 15 p., 13 plans. (MLRA 10:3)

1. Russia (1923- U.S.S.R.) Ministerstvo gorodskogo i sel'skogo stroitel'stva.

(Swine houses and equipment)

ZYKOV, A.M., redaktor

[Swine house for 25 sows with young and fattening swine or for 40 sows with young up to 4 months of age; brick walls] Svinarnik na 25 svinomatok s molodniakom i otkormochnym pogolov'iem ili na 40 osnovnykh matok s priplodom do 4 mesiatsev; steny kirpichnye. Proekt no. 0284. Moskva, 1956. 16 p., 14 plans. (MLRA 10:3)

1. Russia (1923- U.S.S.R.) Ministerstvo gorodskogo i sel'skogo stroitel'stva.

(Swine houses and equipment)



ZUBKIN, A.Ya., arkhitekt; ZIKOV, A.M., redaktor

[Houses for fattening 150 swine; walls of logs] Svinarnik-otkornochnik  
na 150 golov; steny rublenye. Tipovoi proekt No.0231. Moskva, 1956.  
16 p. 14 plans. (MIRA 9:12)

1. Russia (1923- U.S.S.R.) Ministerstvo gorodskogo i sel'skogo  
stroitel'stva.

(Swine houses and equipment)

ZYKOV, A.M., redaktor

[Silo trenches and pits of local building materials. Plan no.1113]  
Silosnye transhei i iany iz mestnykh stroitel'nykh materialov. Proekt  
no.1113. Moskva, 1956. 17 p., 5 plans. (MIRA 10:3)

1. Russia (1923-  
stroitel'stva.  
(Silon)

U.S.S.R.) Ministerstvo gorodskogo i sel'skogo

ZYKOV, A.M., redaktor

[Swine house for 15 sows; wooden frame walls] Svinarnik na 15 svino-  
matok; steny dereviannye karkasnye. Proekt no.0278. Moskva, 1956.  
28 p., 15 plans. (MLRA 10:3)

1. Russia (1923- U.S.S.R.) Ministerstvo gorodskogo i sel'skogo  
stroitel'stva.

(Swine houses and equipment)

ZYKOV, A.M., inzh., red.; PEVZNER, A.S., red. izd-va,; MEL'NICHENKO, P.P.,  
tekhn. red.

[Manual of consolidated indices of the cost of planning and research. Effective January 1, 1958] Spravochnik ukрупnennykh pokazatelei stoimosti proektnykh i izyskatel'skikh rabot. Vvoditsia v deistvie s 1 ianvaria 1958 g. Moskva, Gos. izd-vo lit-ry po stroit., arkhitekt. i stroit. materialam. Pt. 21. [Agricultural enterprises, buildings, and structures] Sel'skokhoziaistvennye predpriiatiia, zdanii i sooruzheniia. Izd. 2. 1958. 22 p.  
(MIRA 11:12)

1. Russia (1923- U.S.S.R.) Gosudarstvennyi komitet po delam stroitel'stva.

(Agriculture)

FILIN, N.A.; ZYKOV, A.M.; AFANAS'YEV, V.N.; MAMONTOV, V.V.

Kinetics of sulfurizing nickel and cobalt by sodium sulfate  
in presence of carbon. Trudy LPI no.223:161-173 '63.

(MIRA 17:11)

FILIN, N.A.; ZYKOV, A.M.; IVANOV, Ye.V.; KRASAVIN, V.V.

Sulfurizing oxidized nickel-cobalt ores by  
Trudy LPI no.223:174-189 '63.

sodium sulfate.  
(MIRA 17:11)

TEPEL'BAUM, P.I.; ZYKOV, A.N.

Working schedules in rolling mill operations. Proizv.opyt  
v tiazh.mash. no.3:3-16 '55. (MLRA 10:2)

(Rolling mills)

ZYKOV, A.N.

[The Irkutsk Communists in the struggle for the development of socialist relations in rural areas after the defeat of the Kolchak forces in 1920] Irkutskie kommunisty v bor'be za razvitiye sotsialisticheskikh otnoshenii v derevne posle razgroma kolchakovshchiny, 1920 god. Irkutsk, Irkutskoe obl. ot-nie ob-va po raspr. polit.i nauchn. znaniy RSFSR, 1960. 36 p.

(MIRA 15:4)

(Irkutsk Province--Communist Party of the Soviet Union--Party work)  
(Irkutsk Province--Agriculture)



VOYTENKO, A.Ye.; ZYKOV, A.P.; SAMYLOV, S.V.

Noninductive cable for the wiring of capacitor batteries.

Prib. i tekhn. eksp. 9 no.5:202 S-O '64.

(MIRA 17:12)

ZYKOV, A.V. (Moskva)

Doctor dissertations approved by the High Commission for Certification in December 1961. Terap. arkh. 35 no. 5:106-108  
My'63 (MIRA 16:12)

1. Starshiy inspektor Vysshey attestatsionnoy komissii,  
Moskva.

ZYKOV, A.V. (Moskva)

Doctoral dissertations approved by the Higher Certifying  
Commission in January 1962. Terap. arkh. 35 no.9:120-122  
S'63 (MIRA 17:4)

1. Starshiy inspektor Vysshey attestatsionnoy komissii.

*ZYKOV A. V.*

ALICHKIN, S.L.; AGRINSKIY, N.I.; ANDREYEV, G.F.; BAKUMENKO, G.D.;  
VORONTSOV, S.M.; VOYSTRUKOV, I.V.; GRADYUSHKO, G.M.; ZYKOV, A.V.  
IVANOVTSSEV, P.V.; KINBURG, M.Ya.; KOVALEV, P.A.; KOZLOVSKIY, Ye.V.  
KORNIYENKO, A.P.; KOLYAKOV, Ya.Ye.; LAKTIONOV, A.M.; LEVADNYY, B.A.  
MEDVEDEV, I.D.; NOVIKOV, N.V.; ORLOV, F.M.; OSTROVSKIY, A.A.;  
ORTSEV, V.P.; PENIONZHKO, A.M.; POLOZ, D.D.; PRITULIN, P.I.;  
PETUKHOVSKIY, A.A.; ROGALEV, G.T.; RYBAK, P.Ya.; SUTYAGIN, G.P.  
TUKOV, R.A.; KHAVCHENKO, D.F.; CHERNETSKIY, T.I.; SHPAYER, N.M.  
SHUSTOVSKIY, P.A.

Nikolai Vasil'evich Spesivtsev. Veterinariia 35 no.2:96 F '58.

(MIRA 11:2)

(Spesivtsev, Nikolai Vasil'evich, 1901-1957)

371 2

ZYKOV, B.I., inzh.; NEKRASOV, V.A., inzh.; CHURAYEV, G.P., inzh.

Manufacture of peat litter slabs with a stamping press. Torf.  
prom. 39 no.7:25-27 '62. (MIRA 16:8)

1. Filial Vsesoyuznogo nauchno-issledovatel'skogo instituta  
torfyanoy promyshlennosti.  
(Peat industry—Equipment and supplies)

ZYKOV, D., kand.tekhn.nauk

Harnessed time. IUn.Tekh. 4 no.5:12-15 My '60.

(MIRA 13:7)

(Chemical engineering)

ZYKOV, D., kand.tekhn.nauk

Electrons work with chemists. IUn.tekh. 4 no.1:63-65

Ja '60.

(MIRA 13:5)

(Electronic control) (Distillation, Destructive)



ZYKOV, D., kand.tekhn.nauk

Machines used by chemists. IUn.tekh. 2 no.8:24-26 Ag '59.  
(MIRA 12:7)

(Chemical engineering--Apparatus and supplies)

AVROV, P.Ya.; AYDALIYEV, Zh. A.; AUEZOV, M.O.; AKHMEDESAFIN, U.M.; BATISHCHEV-  
 TARASOV, S.D.; BAZANOVA, N.U.; BAISHEV, S.B.; BAYKONUROV, A.B.;  
 BEKTUROV, A.B.; BOGATYREV, A.S.; BOK, I.I.; BORUKAYEV, R.A.; BURLICHENKO,  
 N.L.; BYKOVA, M.S.; ZHILINSEIY, G.B.; ZYKOV, D.A.; IVANKIN, P.F.;  
 KAZANLI, D.N.; KAYUPOV, A.K.; KENESBAYEV, S.K.; KOLOTILIN, N.F.;  
 KUNAYEV, D.A.; KUSHEV, G.L.; LAVIN, V.V.; MASHANOV, O.Zh.; MEDVEDOV,  
 G.TS.; MONICH, V.K.; MUKANOV, S.; MUSREPOV, G.; MUKHAMEDZHANOV, S.M.;  
 PARSHIN, A.V.; POPOVSKIY, S.N.; POLOSUKHIN, A.P.; RUSAKOV, M.P.;  
 SERGIYEV, N.G.; SHYFULLIN, S.Sh.; TAZHIBAYEV, P.T.; FESENKOV, V.G.;  
 SHLYGIN, Ye.D.; SHCHERBA, G.N.; CHOKIN, Sh.Ch.; GHOLPANKULOV, T.Ch.

Sixtieth birthday of Academician Kanysh Imantaevich Satpaev. Vest.  
 AN Kazakh. SSR 15 no.4:58-61 Ap '59. (MIRA 12:7)  
 (Satpaev, Kanysh Imantaevich, 1899-)

ZYKOV, D. A.

Zykov, D. A. = "Heredity and variability in the light of Academician T. D. Lysenko's Teaching," Trudy Alma-At. vet.-zoo-tekhn. in-ta, Vol. V, 1948, p. 18-27

So: U-3566, 15 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 13, 1949)

ZYKOV, D. A.

Zykov, D. A. - "Field grass sowing on irrigated soils in Alma-Ata oblast,"  
Trudy Alma-At. vet.-zootskhn. in-ta, Vol. V, 1948, p. 300-07

So: U-3566, 15 March 53, (letopis 'Zhurnal 'nykh Statey, No. 13, 1949)

ZYKOV. D. A.,

Agriculture & Plant & Animal Industry.

Agronomic principles in organization of a fodder depot  
for livestock raising in the northeastern provinces of  
the Kazakh S.S.R. Alma-Ata, Kazakhoskoe gos. izd-vo, 1950.

Monthly List of Russian Accessions, Library of Congress,  
April, 1952. UNCLASSIFIED.

ZYKOV, D.A., deystvitel'nyy chlen.

Tasks of scientific institutions in the creation of a stable forage supply. Vest. AN Kazakh. SSR 10 no.11:3-12 N '53. (MLRA 6:12)

1. Akademiya nauk Kazakhskoy SSR.

(Forage plants)

USSR/Agriculture - Stock feeding

Card 1/1 : Pub. 123 - 2/17

Authors : Zykov, D. A., Act. memb. of the Acad. of Sci. of the Kaz. SSR

Title : Analysis of problems dealing with the establishment of stabilized feeding bases for animals

Periodical : Vest. AN Kaz. SSR, 11/3 (108), 3-7, Mar 1994

Abstract : An account is given of a study, conducted to determine under which natural resources can be utilized in establishing stabilized bases for feeding animals.

Institution : ...

Submitted : ...

*Zykov, D. A.*  
USER/ Agriculture

Card 1/1      Pub. 123 - 3/16

Authors      :   Zykov, D. A., Act. Memb. of the Acad. of Sc., Kaz-SSR

Title        :   Agriculture in the Aktyubinsk region in connection with the utilization of virgin soil

Periodical   :   Vest. AN Kaz. SSR 12, 21-38, Dec 1954

Abstract    :   The conversion of large arid land areas of the Aktyubinsk region (Kaz-SSR) into wheat growing and grazing lands is announced. The measures taken in protecting the newly acquired agricultural areas against the elements of winds and sand storms are described.

Institution :   ....

Submitted   :   ....



2 K. D.

USSR/ Scientists - Agrotiology

Card 1/1      Pub. 123 - 5/11

Authors : Zykov, D. A., Act. memb., Acad. of Sc., Kaz. SSR

Title : The teaching of I. V. Michurin, great contributor to materialistic agrobiological science

Periodical : Vest. AN Kaz. SSR 12, 43-51, Dec 1955

Abstract : Lecture presented by the author honoring the 100-th birthday of the famous Russian agrobiologist I. V. Michurin.

Institution : .....

Submitted : November 5, 1955

FEDOROVICH, B.A., prof., doktor geograf.nauk, otv.red.; ZYKOV, D.A., akademik, agronom-rasteniyevod, red.; IVANOVA, Ye.N., prof., doktor sel'skokhoz.nauk, red.; KALININA, A.V., kand.biolog.nauk, red.; LAVRENKO, Ye.M., red.; KUSHNEV, S.L., kand.geogra.nauk, red..  
Prinimali uchastiye: YEROKHINA, A.A., pochvoved; IVANOVA, Ye.N., pochvoved; ROZOV, N.N., pochvoved; ZATENATSKAYA, N.P., gidrogeolog; KARPEKINA, L.S., red.izd-va; SMIRNOVA, A.V., tekhn.red.

[Division of northern Kazakhstan into natural regions; Kustanay Province, North Kazakhstan Province, Kokchetav Province, Akmolinsk Province, and Pavlodar Province] Prirodnoe raionirovanie Severnogo Kazakhstan; Kustanskaya, Severo-Kazakhstanskaya, Kokchetavskaya, Akmolinskaya i Pavlodarskaya oblasti. Moskva, 1960. 468 p.

(MIRA 13:7)

1. Akademiya nauk SSSR. Sovet po izucheniyu proizvoditel'nykh sil.
2. Institut geografii AN SSSR (for Fedorovich). 3. AN Kazakhskoy SSR; Sovet po izucheniyu proizvoditel'nykh sil (SOPS) AN Kazakhskoy SSR (for Zыkov). 4. Chlen-korrespondent AN SSSR (for Lavrenko).
5. Pochvennyy institut im. V.V.Dokuchayeva AN SSSR (for Yerokhina, Ivanova, Rozov). 6. Sovet po izucheniyu proizvoditel'nykh sil AN SSSR (for Zatenatskaya).

(Kazakhstan--Physical geography)

ZYKOV, D.A., prof.

Green fallows in northern Kazakhstan. Trudy AZVI 9:36-41 '56.  
(MIRA 15:4)

1. Iz kafedry rasteniyevodstva (zav. kafedroy - akademik,  
zasluzhennyy deyatel' nauki KazSSR, doktor prof. D.A.Zykov)  
Alma-Atinskogo zooveterinarnogo instituta.  
(Kazakhstan--Fallowing)

ZYKOV, D. A.

"The Science of Agriculture in Kazakhstan," p. 295. in Science in Kazakhstan during Forty Years of the Soviet Regime. Alma-ata. Izd-vo AN Kazakhskoy SSR, 1957, p. 452. (Ed. Satpayev, K. I.)

This is a collection of articles (20) compiled by 24 authors on various aspects of scientific progress in Soviet Kazakhstan. One third of the articles also deal with the progress made in the main fields of industrial endeavor. The articles on the development of science survey the main contributions made in the respective branches by Kazakh scientists, and enumerate and describe the existing scientific institutes, organizations, and universities. A large number of scientists are mentioned and their fields of interest stated.

ANDRIANOVA, K.I.; ZYKOV, D.A.; USPANOV, U.U.; GLAZYHINA, D.M., red.;  
ALFEROVA, P.F., tekhn.red.

[Proceedings of the joint scientific session in Kustanay devoted to the problems of the Turgay regional economic complex] Trudy Ob'yedinennoi Kustanskoy nauchnoy sessii, posvyashchennoi problemam Turgayskogo regional'no-ekonomicheskogo kompleksa. Vol.1 [Materials of the agricultural section] Materialy sel'skokhoziaistvennoi sekti. Alma-Ata, Izd-vo Akad.nauk Kazakhskoi SSR. 1958. 239 p.  
(MIRA 12:2)

1. Ob'yedinennaya Kustarayskaya nauchnaya sessiya, posvyashchennaya problemam Turgayskogo regional'no-ekonomicheskogo kompleksa. Kustanay, 1957. 2. Ministerstvo sel'skogo khozyaystva KazSSR (for Andrianova).
  3. Institut pochvovedeniya Akademii nauk KazSSR (for Uspanov). 4. Akademiya nauk KazSSR (for Zikov).
- (Kustanay Province--Agriculture)

SATPAYEV, K.I., akademik, otv.red.; BALBACHAN, Ya.I., kand.tekhn.nauk, red.;  
BOGATYREV, A.S., red.; ZYKOV, D.A., red.; ONIKA, D.G., doktor tekhn.  
nauk, red.; CHOKIN, Sh.Ch., akademik, doktor tekhn.nauk, red.; ZA-  
PLAVNOV, O.V., otv. za vypusk; POGOZHREV, A.S., otv. za vypusk;  
ALFEROVA, P.F., tekhn.red.

[Productive forces of central Kazakhstan; studies of the Karaganda  
Joint Academic Session which took place on November 17-22, 1958]  
Proizvoditel'nye sily Tsentral'nogo Kazakhstana; trudy Karagan-  
dinskoi Ob'edinennoi nauchnoi sessii, sostoiavsheisia 17-22 noiabria  
1958 goda. Alma-Ata, Izd-vo Akad.nauk Kazakhskoi SSR. Vol.1.  
[Plenary session] Plenarnye zasedaniia. 1958. 218 p. (MIRA 12:9)  
(Continued on next card)

SATPAYEV, K.I.---(continued) Card 2.

1. Karagandinskaya Ob'yedinennaya nauchnaya sessiya. Alma-Ata, 1958. 2. Prezident Akademii nauk KazSSR (for Satpayev). 3. Predsedatel' Gosudarstvennogo nauchno-tekhnicheskogo komiteta Soveta Ministrov Kazakhskoy SSR (for Balbachan). 4. Ministr geologii i okhrany neдр Kazakhskoy SSR (for Bogatyrev). 5. Predsedatel' Karagandinskogo sovnarkhosa (for Onika). 6. Akademiya nauk Kaz.SSR; Institut energetiki AN KazSSR; akademik-sekretar' Akademii nauk KazSSR (for Chokin).

(Kazakhstan--Economic conditions)

ZYKOV, D.A., akademik.

Scientific principles applied to agriculture to obtain a billion-  
pood crop in Kazakhstan. Vest. AN Kazakh. SSR 14 no.4:13-18 Ap '58.  
(MIRA 11:6)

1. AN KazSSR.

(Kazakhstan--Grain)



ZYKOV, D.A., akademik

Soil erosion in Kazakhstan and measures to control it. Vest.  
AN Kazakh. SSR 20 no.1:3-10 Ja '64. (MIRA 17:3)

1. Akademiya nauk Kazakhskoy SSR.

ZAGOREVSKIY, V.A.; ZYKOV, D.A.

Problem of the condensation of o-hydroxyacetophenone with  
diethyl oxalate. Zhur. ob. khim. 33 no.8:2469-2471 Ag '63.  
(MIRA 16:11)

1. Institut farmakologii i khimioterapii AMN SSSR.

ZAGOREVSKIY, V.A.; ZYKOV, D.A.; ORLOVA, E.K.

Interaction of chromone-2-carboxylic acid derivatives with amines.  
Zhur.ob.khim. 34 no.2:539-543 F '64. (MIRA 17:3)

Institut farmakologii i khimioterapii AMN SSSR.

MATYSHUK, Igor' Vladimirovich; ZYKOV, D.A., akademik, otv. red.;  
KOROTKOVA, Ye.A., red.; KHUDYAKOV, A.G., tekhn. red.

[Tillage and fertility of Chestnut soils in central Kazakhstan]  
Obrabotka i plodorodie kashtanovykh pochv Tsentral'nogo Kazakh-  
stana Alma-Ata, Izd-vo Akad. nauk Kazakhskoi SSR, 1962. 164 p.  
(MIRA 15:12)

1. Akademiya nauk Kazakhskoy SSR (for Zykov).  
(Kazakhstan--Soils)

5 (3)

AUTHORS:

Zagorevskiy, V. A., Zykov, D. A.,  
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SOV/79-29-7-43/83

TITLE:

Derivatives of Chromonecarboxylic-2-acid (Proizvodnyye khromon-karbonovoy-2-kisloty)

PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 7, pp 2302 - 2306  
(USSR)

ABSTRACT:

In the preceding paper (Ref 1) the synthesis of a number of aryl esters of the chromonecarboxylic-2-acid by means of the acid chloride of this acid was described. The acid chloride was prepared by reaction of thionyl chloride in a pyridine solution of the acid and the crude mixture used without purification. In the present investigation 15 new and different N-substituted amides as well as some other derivatives of the chromonecarboxylic-2-acid were synthesized in search of pharmacologically active compounds (Table). All the substances (I)-(XV) were synthesized by reaction of the acid chloride on the above acid with the corresponding amino, oxy, and mercapto derivatives. The crude acid chloride, obtained by the previously proposed method, was used for reaction in dichloro ethane solution. In every case, excepting (XIII)-(XV), sodium bicarbon-

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## Derivatives of Chromonecarboxylic-2-acid

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ate was used to bind the HCl formed in the reaction. By synthesizing the aryl esters (XIII)-(XIV) it was demonstrated that the acylation of phenols with this acid chloride by the Schotten-Baumann method is possible. The compounds (VIII)-(XII) form water-soluble salts when treated with sodium carbonate or sodium bicarbonate (carboxyanilide (IX)). The relation between the color of the chromonecarboxylic-2-acid anilides and the kind of substituent in the benzene ring of the aromatic amino group is of interest. Thus, for instance, the anilide of the chromonecarboxylic-2-acid is colorless, the p-toluidide (II) is light greenish-yellow. The p-methoxy-(III) and p-oxyanilide (IV) are yellowish-green, whereas the anilides (VI) and (VII) are yellowish-orange or red. The aryl esters of the chromonecarboxylic-2-acid show similar effects. An explanation of this phenomenon will be the subject of further investigations. There are 1 table and 5 references, 4 of which are Soviet.

ASSOCIATION: Institut farmakologii i khimioterapii Akademii meditsinskikh nauk SSSR (Institute of Pharmacology and Chemotherapy of the Academy of Medical Sciences, USSR)

SUBMITTED: June 5, 1958  
Card. 2/2.

5 (3)  
AUTHORS: Zagorevskiy, V. A., Zykov, D. A., Pronina, L. P. SOV/79-29-3-58/61

TITLE: Syntheses in the Series of the Chromone-carboxylic Acid-2 Derivatives (Sintezy v ryadu proizvodnykh khromonkarbonovoy-2-kisloty)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 3, pp 1026-1030 (USSR)

ABSTRACT: It is known that several chromone derivatives are physiologically active compounds. Recently it was found that chromones substituted more simply than the kelling (2-methyl-5,8-dimethoxy-6,7-furanochromone), like e.g. the chromone-carboxylic acid-2 and its esters are active as well (Refs 1-4). This acid has a distinctly marked antispasmodic activity (Ref 5). The authors synthesized some new chromone-carboxylic acid-2 derivatives in order to find new pharmacologically active chromone preparations and in order to clarify the problem of the dependence of the activity on their structure. In publications (Ref 3) only the phenyl-ester is mentioned of the aryl esters of this acid (yield only 18%). In the present paper the aryl esters of the acid (I-VIII) given in the table were synthesized proceeding from its acid chloride and the corresponding phenols. The acid

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## Syntheses in the Series of the Chromone-carboxylic Acid-2 Derivatives

chloride was used in the form of its pyridine solution which was produced by the treatment of the chromone-carboxylic acid-2 solved in pyridine with thienyl chloride. In order to obtain a higher yield of acid chloride thienyl chloride has to be in excess in the reactions with the chromone-carboxylic acid-2. The synthesis with the o-oxyacetophenone as initial product was found to be the best of the syntheses of the chromone-carboxylic acid-2 worked out by the authors. The o-oxyacetophenone was condensed with diethyl oxalate in the presence of sodium ethylate (Ref 3). The mixture of 2 molecules o-oxyacetophenone and diethyl oxalate was added to the solution of sodium ethylate in alcohol. The derivative of the ethyl-ester of the o-oxybenzoyl piroracemic acid ( $\text{CH}_3\text{CO}\cdot\text{COOH}$ ) produced in the case of heating was transformed into the chromone-carboxylic acid-2, first by boiling with concentrated, then with diluted hydrochloric acid (yield 72-80%). Thus a series of aryl esters of the chromone-carboxylic acid-2 is synthesized. The suggested improved synthesis of the chromone-carboxylic acid-2 can be used preparatively in the laboratory for greater quantities as well. The results of the pharmacological investigations of some synthesized preparations are published later on. There are 1 table and 17 references,

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SOV/79-29-3-58/61

Syntheses in the Series of the Chromone-carboxylic Acid-2 Derivatives

2 of which are Soviet.

ASSOCIATION: Institut farmakologii i khimioterapii Akademii meditsinskikh nauk SSSR (Institute of Pharmacology and Chemotherapy of the Academy of Medical Sciences, USSR)

SUBMITTED: February 16, 1958

Card 3/3

ZAGOREVSKIY, V.A.; ZYKOV, D.A.

Mechanism of formation of 4-chlorocoumarin from 2-chromonecarboxylic acid chloride. Zhur. ob. khim. 30 no.9:3100-3103 S '60.

(MIRA 13:9)

1. Institut farmakologii i khimioterapii Akademii meditsinskikh nauk SSSR.

(Coumarin)

ZAGOREVSKIY, V.A.; ZYKOV, D.A.; ORLOVA, E.K.

Some derivatives of gallic acid. Zhur. ob. khim. 30 no.9:3103-3104  
S '60. (MIRA 13:9)

1. Institut farmakologii khimioterapii Akademii meditsinskikh nauk  
SSSR.

(Gallic acid)

ZAGOREVSKIY, V.A.; ZYKOV, D.A.

Reactions of 2-chromonecarboxylic acids and their esters with diamines. Zhur. ob. khim. 30 no.11:3579-3584 N'60.(MIRA 13:11)

1. Institut farmakologii i khimioterapii Akademii meditsinskikh nauk SSSR.

(Chromonecarboxylic acid) (Amines)

ZAGOREVSKIY, V.A.; ZYKOV, D.A.; ORLOVA, E.K.

Synthesis of substituted 2-chromonecarboxylic acids and their esters. Zhur. ob. khim. 30 no.12:3894-3898 D '60. (MIRA 13:12)

1. Institut farmakologii i khimioterapii Akademii meditsinskikh nauk SSSR,

(Chromonecarboxylic acid)

ZAGOREVSKIY, V.A.; ZYKOV, D.A.; ORLOVA, E.K.

Conversion of 2-chromonecarboxylic acids to 4-chlorocumarins.  
Zhur. ob. khim. 31 no. 2:568-574 F '61. (MIRA 14:2)

1. Institut farmakologii i khimioteranii AMN.  
(Chromonecarboxylic acid) (Coumarin)

ZAGOREVSKIY, V.A.; ZYKOV, D.A.

Series of pyran, its analogs, and related compounds. Part 2:  
Dialkylaminomethylation of esculetin and 4-methylesculetin.  
Zhur.ob.khim. 33 no.3:793-797 Mr '63. (MIRA 16:3)

1. Institut farmakologii i khimioterapii AMN SSSR.  
(Pyran) (Esculetin) (Coumarin)

• ZYKOV, D.A.

Methods for developing a reliable feed supply on collective and state  
farms of Kazakhstan. Izv. AN Kazakh. SSR. Ser. biol. nauk no. 2:7-15  
'63. (MIRA 17:10)



ZAGOREVSKIY, V.A.; TSVETKOVA, I.D.; ORLOVA, E.K.; ZYKOV, D.A.

Rare case of a direct formation of imines in the chromone series. Zhur. org. khim. 1 no.8:1517-1518 Ag '65. (MIRA 18:11)

1. Institut farmakologii i khimioterapii AMN SSSR.

<p>100 AND 1000000</p> <p>PROCESSES AND PROPERTIES INDEX</p>		<p>21</p>
<p>The manner of development of the sintering process.</p> <p>1) U. Zykun, <i>Khim. Tverdogo Topliva</i> 8, 100-7 (1937); <i>Chem. Zvesti</i> 1939, II, 283-4. -- A historical review. The development of the process and its future in the U. S. R. are discussed. Accurate knowledge of the technological properties of the raw material is essential in detg. the conditions for low-temp. carbonization. M. G. M.</p>		
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>		
<p>REGION 111000000</p> <p>1000000</p>	<p>REGION 111000000</p> <p>1000000</p>	<p>REGION 111000000</p> <p>1000000</p>

ZYKOV, D.D.

PHASE I BOOK EXPLOITATION SOV/5329

Yegorov, Nikolay Nikolayevich, Mikhail Mikhaylovich Dmitriyev,  
Dmitriy Dmitriyevich Zykov, and Yuriy Nikolayevich Brodskiy

Ochistka ot sery koksoval'nogo i drugikh goryuchikh gazov  
(Purification of Coke Gas and Other Combustible Gases From  
Sulfur) 2d ed., rev. and suppl. Moscow, Metallurgizdat, 1960.  
341 p. Errata slip inserted. 3,200 copies printed.

Ed. (Title page): N. N. Yegorov; Ed. of Publishing House: M. L.  
Yezdokova; Tech. Ed.: M. R. Kleynman.

PURPOSE: This book is intended for technical personnel of the  
by-product coke and gas industries, and may also be used by  
students specializing in the processing of fuels and combustible  
gases.

COVERAGE: The book reviews methods of removing hydrogen sulfide  
and organic sulfur compounds from combustible gases, with evalu-  
ations and comparisons of the more widely used and promising  
methods. For those techniques which are of practical value in

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00513R00206581000

ZYKOV, D. D.

"Use of Hidden Reserves in Industry," Iz. Ak. Nauk SSSR, Otdel. Tekh. Nauk, No. 3, 1940.

Report U-1530, 25 Oct 1951